

REPORT OF A CASE OF RECURRENT DISLOCATION OF THE ULNAR NERVE CURED BY OPERATION.

WITH SUMMARY OF PREVIOUSLY REPORTED CASES.

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THE rarity of this kind of operation and the very successful result in the following case have seemed to the writer to justify this report and analysis.

Recurrent dislocation of the ulnar nerve at the elbow may occur (1) from non-traumatic causes, the so-called "habitual," "congenital," or idiopathic cases; (2) from trauma. The cases of "habitual" dislocation are much more numerous, but in these cases the symptoms are rarely severe enough to need operation and, as a rule, yield to simple palliative treatment. Traumatism has furnished all the cases which have been operated upon, with two exceptions,—the cases of Sir William MacCormac and Damas, summarized later in this article.

Abnormal mobility of the ulnar nerve is not uncommon, and may be present to the extent of complete luxation forward of the internal condyle without causing any symptoms, and even without the knowledge of the individual. Collinet found that in 500 persons, the nerve slipped completely forward on flexion of the forearm in thirteen, and in five of these the dislocation involved both nerves (right and left). Drouard found complete luxation in three out of 200 patients. The majority of these persons had no symptoms. The writer, in a series of 150 large and well-developed men, found only one case of complete dislocation forward of the condyle, and this caused no symptoms. In over one-third of the cases, the nerve, on flexion of the forearm, slipped or was pushed by the triceps

muscle nearly or quite to the tip of the internal epicondyle, but not over it or forward. The writer has seen characteristic disabling pain down the nerve into the fingers on flexion of the forearm in only one case, where no increased mobility of the nerve could be found. This was the case of a tinsmith who had been disabled for six months. Flexion of the forearm caused pain at the inner side of the elbow and into the inner fingers of the hand, but in his case no luxation or abnormal slipping of the nerve could be made out. Rest upon the splint caused his painful symptoms to disappear. It is the accepted theory of nearly all of the men who have reported cases of this condition that the darting pain along the course of the nerve is caused by the trauma of the oft-recurring excursions or jumps over the condyle, and that in a comparatively short period of time pathological changes in the nerve and its sheath take place. In most of the cases operated upon the nerve was found to be distinctly enlarged and fusiform in shape. The only case in which a microscopic examination of the nerve structure has been made was in the case of Andrae, which is summarized among the cases given below. Acting on the theory that the dislocation was due to excessive length of the nerve caused by stretching, Andrae excised the fusiform enlargement and sutured the ends of the resected nerve together. Examination of this excised piece showed a typical neurofibroma with marked thickening of the nerve sheath.

The whole subject of luxation of the ulnar nerve has been treated by Poncet, Momburg, Schwartz, Annequin, and Jopson of Philadelphia, and by Cotton of Boston. If a complete review of the question is desired, the papers of these surgeons must be consulted. The practical conclusion from all their research is that idiopathic dislocation is not uncommon, but, as a rule, the symptoms are not serious enough to demand operation.

It is the purpose of this paper to report a traumatic case operated upon by the writer and to summarize all other reported cases of operation, only fifteen in number. So far as known, no complete collection of these operations has been made.

The report of the writer's case is as follows:

J. W., single, aged fifty-two years, a lumberman by occupation, was seen first at the Massachusetts General Hospital in September, 1900. His family history was unimportant, likewise his personal history previous to this disability. Two years before, he struck the inner side of the left elbow violently against a post while trying to save himself from a fall. At that time the elbow was swollen and tender, and motion of the forearm caused pain in the region of the joint, but he had no recollection of painful or tingling sensations in the hand immediately following the injury. The elbow was bandaged by his family physician, who told him that no bones were broken. In ten days or two weeks the swelling and tenderness had disappeared, and the elbow gave him little trouble until a month later, when the present disabling pains began. This pain has constantly increased, and at times has been very severe over the inside of the elbow and down the inner side of the forearm into the two inner fingers of the hand. Numbness in these fingers has been present constantly for the past year. Over twelve months ago he began to notice that flexion of the forearm caused these pains and tingling sensations, and that there was a "round cord" at the inner side of his elbow that slipped forward and back, and when he struck this or pressed upon it he started up the familiar darting pains. For six months he has been disabled for any kind of work, and has kept from moving his forearm as much as possible. The patient was a man of moderate muscular development, whose general physical condition was sound in every respect. Examination of the left arm showed the bones normal in size and position, and all the motions of the elbow-joint entirely free; no evidence of old fracture was present. Flexion and extension of the forearm caused pain referred to the internal condyle of the humerus, the inner side of the forearm, and the two inner fingers of the hand. The ulnar nerve could be felt under the skin, and, comparing it with the right ulnar nerve, which was presumably normal in size, appeared to be twice as large. In extension of the forearm the enlarged nerve could be felt back of the internal condyle, but apparently more superficial than on the right side; but on flexion of the forearm past a right angle the nerve could be felt to roll over the tip of the internal condyle, until on complete flexion it was dis-

tinety felt well in front of the condyle. This rolling forward of the nerve always caused the pain in the fingers and at the elbow. The enlarged nerve could be held in position behind the condyle during the flexion of the forearm by pressure with the fingers. Pressure on the nerve or rolling it with the fingers caused the patient much pain, not only at the elbow, but also throughout distribution in the hand. There was no loss of sensation in the region supplied by the ulnar nerve. The strength of the hand was good and there was no apparent muscular atrophy. He was advised to try palliative treatment for a few weeks, and if this proved of no avail to submit to an operation. Accordingly, the arm was put at rest on an internal right-angled tin splint with a pad holding the nerve firmly in place. While this splint was worn he was free from pain, but on removing it at the end of three weeks the recurrent luxation of the nerve with the accompanying pain at once reappeared. Upon this he was admitted to the hospital on the service of Dr. H. H. A. Beach, through whose courtesy the writer, his assistant surgeon, was permitted to operate.

Operation.—Under ether anæsthesia, with the forearm slightly flexed, a somewhat curved incision three and a half inches long was made midway between the olecranon and the tip of the internal condyle. As the skin was dissected back, it became apparent that the enlarged nerve was very superficial, and the bony groove at the back of the internal condyle, in which normally the nerve should rest, was filled by muscle-fibres, evidently a portion of the triceps. The nerve was covered by a loose and thin investment of fibrous tissue, and could be easily moved about between the points where it emerged from the intermuscular septum and passed through the two heads of the flexor carpi ulnaris muscle. For the distance between these two fixed points the nerve was fusiform in shape and as large as a lead-pencil in the thickest portion. There was no strong bridge of fascia, the so-called arcuate ligament, passing over the nerve; and it was manifest that at the original injury the fibrous and muscular structures back of the internal condyle had been torn or ruptured, and that not only had the tearing of the tissues allowed subsequent freedom of motion to the nerve to the extent of dislocation forward, but that in the process of repair the bony groove previously and normally occupied by the nerve had become completely filled up by some fibres of the triceps muscle. These were dissected

up from their abnormal insertion, and after the nerve had been placed in its groove these fibres and a portion of the fascia of the triceps were carefully sutured with catgut to the fascia covering the flexor carpi ulnaris, thus making a roof over the nerve and its canal. The wound in the skin was sutured with fine silkworm-gut stitches without drainage, and a sterile gauze dressing applied, after which the arm was put up in extension on a straight internal splint. Healing by first intention was obtained. At no time after the operation was there complaint of pain. At the end of two weeks the straight splint was removed and a right-angled splint substituted for one week. At the end of four weeks all bandages were removed and the man was allowed to use the arm. The nerve could no longer be felt; there was none of the old pain on flexion nor any tenderness on pressure. At the present time, two years and a half since the operation, the patient reports that he has been able to use his arm in all ways, and regards himself as absolutely cured.

Summary of previously reported Cases.—The following cases, fifteen in number, are given in chronological order. It will be noticed that the earliest reported operation was done as recently as 1888.

CASE I.—PONCET (*La Semaine Médicale*, 1888, p. 93). Child, fifteen years old, at the age of ten years fell from a horse, receiving an injury to the right elbow which necessitated rest on a splint for five days. This injury caused no lasting disability. Five years after, when violently throwing snowballs, had sudden and severe darting pain into the two inner fingers of the right hand. Could not rest the elbow on the table, as in writing, without causing this pain. No mention of pain at the elbow. Examination showed evidence of an old fracture with shortening of the internal condyle; no internal epicondyle could be felt. Palpation of the nerve caused painful sensations in the fingers.

Operation.—Kind of incision not mentioned, nor the size and shape of nerve or condition of the tissues in the region of the condyle. A new canal for the nerve was made by dissecting up fibroperiosteal flaps from the back of the deformed condyle, and stitching them to the nerve with three catgut sutures, after which the nerve was covered by flaps of fascia. Kind of fixative dressing after operation not given. Since operation, nerve has remained in place with no return of symptoms.

CASE II.—ANDRÆ. (In nearly all the previous articles this man's name has been spelled Andral; it is correct as here given, George Andræ.) "Über traumatische Luxation des Nervus Ulnaris am Ellbogen," Inaugural Dissertation, Greifswald, December 21, 1889.

Muscular man, struck by a piece of wood over inner side of right elbow; much swelling, discoloration, and pain, with loss of sensation in the ulnar distribution in the hand, and loss of motion in the little finger. A small fragment of bone was broken off the tip of the internal epicondyle. Plaster-of-Paris bandage for four weeks. Examination three months after the injury found inability to work because of weakness in the hand and pain in the fingers; the nerve was spindle-shaped and hard and dislocated forward on flexing the forearm, but could be pushed back into its groove and held there; there was a small amount of atrophy of the forearm, and especially in the interossei of the third and fourth spaces in the hand. Sensation was evidently weakened. Andrae thought the disturbances of motion and sensation could not be cured by restoring and fixing the nerve to its normal position, and also that the dislocation was caused by the nerve being too long. He therefore, four months after the injury, resected the fusiform enlargement without attempting to fix the nerve in place. Microscopic examination of excised piece showed typical neurofibroma. One month after the operation a spindle-shaped enlargement was again felt, and dislocation still occurred. Four months after patient was much worse than before the operation, with increasing atrophy, pain, and loss of sensation.

CASE III.—ANNEQUIN ("Archives de Médecin et de Pharmacie Militaires," Paris, 1890, Tome xv, p. 432). A soldier fell in the gymnasium, striking violently on the internal aspect of the left elbow. Immediately he noticed severe shooting pains in the last two fingers, followed rapidly by loss of sensation and motion. These symptoms persisted until entering the hospital, nine days after the injury. A general swelling, without hæmatoma at the elbow, was said to have existed previous to entrance. Examination showed almost complete loss of motion and sensation in that part of the hand supplied by the ulnar nerve, but no atrophy or vasomotor disturbance. The nerve was felt just under the skin, and was evidently enlarged; in flexion of the forearm it rolled well to the front of the internal condyle, and even in extension did not go farther back than the tip of the epicondyle. Flexion of the forearm or pressure on the nerve caused pains into the fingers. No evidence of fracture found. An internal right-angled splint with a pad over the nerve worn for twenty-seven days; while wearing this, sensation and motion returned to the fingers. On the removal of the splint, dislocation of the nerve immediately recurred and all the disabling symptoms. Operation thirty-nine days after the injury. Incision slightly curved, midway between the olecranon and internal epicondyle. The strong fibrous arch (the arcuate ligament) which normally crosses the nerve was wanting. An exceptionally low and strong insertion of the triceps muscle to the inner border of the olecranon was found (no insertion of muscle into the groove back of the condyle, however); because the operator thought these muscle-fibres would not unite well to the aponeurotic flap he excised them, *i.e.*, where they ran down on the olecranon. He concluded, however, that this was a mistake, and that this part of the triceps should have been used as a flap to cover the nerve, as was done in the writer's case. The nerve

was replaced and covered with flaps of fascia; the internal flap from the internal lateral ligament and periosteum, the external from the fascia of the triceps, "especially" from the triceps tendon; these flaps were sutured over the nerve with catgut. The external wound was closed without drainage, and an internal right-angled splint applied and left on for three weeks. For some days after removing the splint, flexion caused sharp pain at the elbow, but at the end of the fifth week this had disappeared. Ultimate result was entirely successful. Appearance and size of the nerve not remarked upon at operation.

CASE IV.—G. MUNRO SMITH (*British Medical Journal*, February 11, 1893). Very brief report of this case obtainable. A man fell, striking elbow; no fracture. Nerve felt in front of the epicondyle, but could be reduced easily. No account of symptoms given, but the inference is that pain was present. Attempts to keep the nerve in place by pads, etc., for six weeks failed. Seven weeks after the injury nerve fastened in place with catgut sutures. Built a bridge behind nerve by uniting the triceps tendon and the firm connective tissue about the internal condyle. Result said to have been good.

CASE V.—SIR WILLIAM MACCORMAC (*London Lancet*, 1891, p. 1041; *Transactions of American Surgical Association*, 1895, Vol. xiii, p. 375). Man, aged thirty years; clerk by occupation; previous occupation and heredity unimportant. Two years preceding 1891, without trauma or any known cause, first noticed a painful weakness in his right arm, which soon became serious enough to prevent his writing steadily. Examination at the end of the second year found a man in good general health complaining of much pain shooting down into the ring and little fingers of the hand, especially when resting the elbow on the table in writing, with the pain a constant sense of fatigue in the hand and forearm. No anæsthesia, no paralysis or atrophy evident. On flexing the forearm the ulnar nerve was found to dislocate quite forward of the internal epicondyle. The patient had noticed the loose nerve himself.

Operation.—Two years after the first symptoms. A longitudinal incision midway between the olecranon and tip of internal condyle two inches long. The nerve had a "thickened sheath." Two kangaroo tendon loops were passed around the nerve, one inch apart, and fastened to the fascia over the triceps, and the fascia was then sutured over the nerve (how is not stated). External wound closed without drainage, and a plaster-of-Paris bandage applied (position of arm not stated, nor length of time splint was left on). Result was a complete cure. Nerve has remained in place.

(This case and the one following have been referred to as cases of E. C. Stabb. They were first reported by him, *London Lancet*, 1897, Vol. i, p. 1040.)

CASE VI.—MR. CROFT (*London Lancet*, 1891, p. 1040; *Transactions of American Surgical Association*, 1895, Vol. xiii, p. 377). Woman, twenty-eight years old, fell, striking her elbow. Septic infection followed, starting as a bursitis. Two incisions were made, but not in the region of the ulnar nerve. The suppuration ("cellulitis") was entirely superficial,

and had subsided in one week. There was no fracture. A few days after noted tingling pain from elbow into two inner fingers, which pain was aggravated by flexion, and was associated with a feeling of numbness and sensation of something slipping at the under side of the elbow. Examination two months after the injury found nerve dislocated on flexion, no paralysis of motion or sensation, no atrophy.

Operation.—Semilunar incision; nerve had a "thickened sheath" and was readily movable; it was stitched to the anterior surface of the triceps, and then the inner border of the triceps was sutured to the fascia over the flexor group of muscles. Silk was the material used. Wound closed without drainage, and a plaster-of-Paris bandage with the arm in extension (time of wearing this not given). For two days after the operation slight dulness of sensation and pricking in the little finger. Result was successful. Nerve remained in place.

CASE VII.—M. SCHWARTZ (*Bulletin et Mémoires de la Société de Chirurgie de Paris*, Tome xxii, 1896, p. 202). In October, 1895, a man, eighteen years of age, caught the right upper extremity in a machine while it was in motion, so that, while his forearm was flexed at an angle of ninety degrees, the elbow was grasped so firmly as to tear the skin for some distance from the anterior surface. Immediately after this he felt sharp pains dart into the two inner fingers of the hand. No paralysis of sensation or motion noticed; much swelling of the elbow followed. The wound in the skin was dressed antiseptically and healed kindly. Within two weeks after the accident, splints and bandages were removed and he returned to work; but he noticed that each time he flexed the forearm to strike with a hammer he felt pains shooting from the elbow to the fingers, and he himself distinctly felt the jumping out of the "cord" at the inner side of the elbow. As a result, he was disabled for work.

Examination by Schwartz six weeks after the injury was as follows: In front of the elbow a long cicatrix; no evidence of fracture. On flexion of the forearm the ulnar nerve jumped to the front of the condyle, and in extension did not go back entirely behind, but rested on the epicondyle. The nerve could be moved into its groove, but would not stay there. The nerve was easily felt under the skin, enlarged, the size of a lead-pencil. Pressure on the nerve caused local and distributed pain. There was no atrophy, no anæsthesia, no paralysis, no trophic disturbances.

It was not considered worth while to attempt palliative treatment, therefore operation was done two months after the injury. Under general anæsthesia, with the forearm extended, the nerve was felt over the top of the condyle. On exposing the region (by what form of incision is not stated), the groove behind the condyle was found to be empty, and there was no trace of a fibrous aponeurotic bridge. The nerve was replaced in its groove and a flap of fascia from the epitrochlear muscles stitched over the nerve to the fascia covering the triceps; no drainage; an internal right-angled splint. At the end of eight days, primary union of the wound. Time that splint was left on is not stated. The result of the operation was that the nerve remained fixed in its groove during all motions of the forearm, but the patient was not relieved of the pains into

the finger and hand, and he also had some pain in the region of the wound on moving the arm.

Discussion of this case dwelt upon the question as to whether pain before and after the operation was not due to traumatic neuritis from the original injury instead of to the recurring dislocation.

CASE VIII.—R. LOZANO (*Revista de Medicina y Cirurgia Practicas*, Madrid, Tome xliii, 1898, p. 161). Male, farmer, aged thirty-five years; no morbid family or previous history. Fell to the ground while carrying heavy load on shoulder; immediately great pain in right arm at elbow. Pain increased, and in twenty-four hours had great weakness in right hand and forearm; pain made intense by movement of forearm. Soon was disabled for any work, and has been so for over two years. Examination found robust, healthy man. Flexion of right forearm and pressure on ulnar nerve at elbow caused lancinating pains into two inner fingers of hand; lack of sensation to pain and heat in the distribution of the nerve, and a subjective feeling of numbness in lower third of forearm; loss of muscular power in whole hand noted, but specially in flexing last two fingers, also some loss of power in spreading fingers. Curiously enough, since the injury patient has had in the palmar surface of hand following the distribution of the ulnar nerve patches of psoriasis. No lesion of elbow-joint or bones found; ulnar nerve dislocated in front of epicondyle. Lozano theorized that great muscular exertion made to save his load of wood as he fell caused rupture of fibrous band over the nerve.

Operation three years after the fall and first symptoms. No palliative treatment tried. Incision longitudinal, midway between olecranon and epicondyle. The nerve was put back in its groove, and a piece of the triceps muscle excised so that the nerve would not be pushed out of place; the fascia of the triceps was then sutured with catgut to the fascia over the forearm group of muscles; no mention of condition of fibrous structures back of condyle. No drainage; kind of immobilization not given. At the end of fifteen days sensation was restored in the anæsthetic areas; at the end of thirty days the muscular strength had returned. Result was a complete cure.

CASE IX.—JOPSON (*Philadelphia Medical Journal*, September 10, 1898, Vol. ii, p. 524). Case of a boy twelve years old. He had been engaged in violent snowballing for two days, but on the day before the first symptoms had a fall, the nature of which is not stated. Therefore the question of the causation of the dislocation is doubtful. (It will be remembered that in the case of Poncet, Case I, the etiology was in all probability violent use of the arm in snowballing). Pain, located especially over the internal condyle; no evidence of fracture; all relations of bones and muscles apparently normal. The ulnar nerve, on flexion of the forearm, dislocated over the internal condyle. Marked local pain and tenderness, and pressure on the nerve at the elbow caused tingling in the ulnar distribution in the hand. The relations of the ulnar nerve in the other arm were normal. An obtuse-angled splint, with pad over the nerve, was worn for a period of ten days in all. On removal of the splint, dislocation of

the nerve, with resulting pains, returned. Operation was done one month after the first symptom.

Incision made over the usual seat of the nerve, exposing about three inches of it. The groove of the nerve was either absent or filled up, and the fascia enclosing the nerve seemed to have been separated from the olecranon. The fascia covering the heads of the flexor muscles between the olecranon and the internal condyle was divided, and a longitudinal incision was made into the internal head of the triceps muscle above, and parallel with, the edge of its tendon. The nerve was placed in this muscular groove, and secured by two loops of kangaroo tendon around it and over the edges of the muscle. The fascia was then sutured over the nerve with catgut; no drainage; arm put up in extension on a straight splint, with a special pad over the internal condyle; no pain save slight tingling in the two inner fingers of the hand on the second day. Splint removed three weeks after the operation, when the nerve was found in place, and there was no pain or motion on pressure, save that flexion beyond a right angle caused some pain at the elbow. This pain, however, gradually disappeared; six weeks after the operation, case was pronounced cured. Nerve was firmly fixed, and there was no pain or luxation on motion.

CASE X.—E. DAMAS, of Valancee (*Le Bulletin Médical de Paris*, February 9, 1901, p. 119). This is a habitual case, but it is called "congenital" by Damas. Case of recurring dislocation of the right ulnar nerve for a period of four years in a man twenty-two years old. No history of trauma. In this case Damas describes a flattening of the internal condyle posteriorly on both elbows, and dislocation of the ulnar nerve on both sides, but with no symptoms on the left. Flexion of the right forearm caused pain into the little finger and numbness; increasing disability from this pain for four years. The dislocation of the left nerve was not known to the patient. He had been treated by ignipuncture and in other ways. The nerve was enlarged at the elbow and was fusiform in shape. No mention made of paralysis of sensation or motion, or of atrophy.

Operation.—Incision eight centimetres long, straight, over the tip of the epicondyle; detachment of periosteum from posterior face of the condyle, cutting a groove for the nerve with a gouge. (Nothing noted about condition of fibrous or muscular strictures.) The nerve was covered over with a flap of fascia from the flexor group of muscles, which flap was sewed to the periosteum of the olecranon, folding the fascia in with silk Lembert stitches. No drainage used. No mention of splints after the operation; result stated to have been perfect. Damas states that congenital absence of the annular ligament and absence of a bony groove caused luxation of the nerve in this case. Damas is the only surgeon who thought it necessary to gouge out a groove in the bone.

CASE XI.—MOMBURG (*Archiv für klinische Chirurgie*, Berlin, Band lxx, Heft 1, 1903, pages 215-232). Grenadier, twenty-one years old. On January 2, while exercising on a cross-bar, he felt a sudden snap and pain at right elbow-joint. Since this he has had swelling and pain at joint after exertion. Pain running into little finger, and felt especially on

forced extension and flexion. Trouble grew worse, and he was sent to the hospital.

Examination.—Muscular man. Right ulnar nerve on flexion of arm slipped over and below the internal epicondyle. Returned to normal position on extension. Forced movement caused characteristic pain. Same seen at left elbow, but here nerve only was dislocated to tip of epicondyle. No pain on left side. Both internal condyles seemed somewhat flat. In extension both nerves were exceptionally movable.

Momburg formed a new sheath in the normal place from fascial layers on February 15, 1902; the trouble recurred.

Second Operation, May 10, 1902.—Kind of incision and appearance of nerve not given. Formed a musculo-tendinous flap from the triceps by splitting the tendon by vertical incision of six to seven centimetres, following this by transverse incision towards the inner side of the arm at the top of the vertical one. The flap thus formed was carried under the nerve and back over it to its normal position and secured there with silk stitches. The nerve was thus made to run under and through the triceps tendon and fibres. Primary union with arm extended; passive motion in two weeks. Good result.

In discussion, he says that luxation of the ulnar nerve is frequent, but is only rarely seen because it gives no trouble, unless the nerve becomes inflamed.

CASE XII.—M. SCHWARTZ (*Bull. et Mémoires de la Soc. de Chir. de Paris*, 1903, n. s. xxix., p. 3). Man, twenty-nine years old; street-sweeper; well except for present accident. Two months previous, following violent effort to lift a load, felt much pain in right arm. Impossible to continue work. Each time he tried to push a broom he felt pain in forearm, especially in the last two fingers; paræsthesia. Had less strength in arm and was unable to raise a box above his head to dump it into the cart.

Inspection negative. Palpation shows a large cord which is displaced on flexion onto the top of the epitrochlear. Pressure with finger gives rise to tingling in last two right fingers. On extension of arm, nerve resumes its normal position.

Operation, November 29, 1902.—Straight incision between olecranon and epitrochlear. Nerve easily seen after incision of soft parts. Seemed that fibrous tissues which covered the nerve were very lax, if not actually thinned. Especially noticeable was the thickening of the nerve to twice the normal size. The enlargement was fusiform and extended about two centimetres. The epitrochlear was slightly less prominent than on well side. Groove for nerve seemed of normal depth. Schwartz cut a flap from the aponeurosis attached to the epitrochlear, turned it back and sutured it to the olecranon. No drainage. Arm bandaged at right angles.

One and one-half months later, patient can sweep easily, but still experiences some difficulty in raising a load above the head.

CASES XIII, XIV, XV.—KRAUSE (Vortrag in der Sitzung des Aerztlichen Vereins in Hamburg am 31. October, 1899. Quoted from Momburg). Three cases. Details not given. Krause chiselled a periosteal bone-flap from the olecranon, turned it over, and sutured it with catgut

to the remaining periosteum covering the internal epicondyle. Cure of symptoms in all three cases.

Conclusions.—One must conclude that operation for this condition has every chance of perfecting a cure. It should be remembered that only the severe cases, few in number, and for the most part traumatic, need ever be operated upon. Operation should never be undertaken for dislocation of the nerve alone, but only for the symptoms caused by the recurring dislocation, and only in those cases in which the symptoms are severe and disabling. The steps of the operation are simple, and will necessarily be the same in the majority of cases.

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